

Data Transmission Element for Downhole Drilling Components

Abstract

A robust data transmission element for transmitting information between downhole components, such as sections of drill pipe, in the presence of hostile environmental conditions, such as heat, dirt, rocks, mud, fluids, lubricants, and the like. The data transmission element components include a generally U-shaped annular housing, a generally U-shaped magnetically conductive, electrically insulating element such as ferrite, and an insulated conductor. Features on the magnetically conducting, electrically insulating element and the annular housing create a pocket when assembled. The data transmission element is filled with a polymer to retain the components within the annular housing by filling the pocket with the polymer. The polymer can bond with the annular housing and the insulated conductor but preferably not the magnetically conductive, electrically insulating element. A data transmission element is mounted within a recess proximate a mating surface of a downhole drilling component, such as a section of drill pipe.